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Abstract of
U.S. Navy Special Operations (1140) Community
Diving and Salvage Functional Area

An examination of the Diving and Salvage functional area of the 1140 community reveals a long history of U.S. Navy salvage operations accomplished by a variety of human resources. Early marine salvage was the purview of the engineering community, assisted by senior enlisted divers, and on occasion by the unrestricted line Navy. Salvage organizations were generally temporary in nature and were abandoned as soon as the task at hand, crisis, or war was over. The diving and salvage community took divergent paths during the era between the world wars. The submarine force developed surface supplied deep diving techniques, Helium-Oxygen mixed gas diving, submarine rescue, and submarine salvage procedures. Their surface counter-parts did not show much interest, and diving and salvage was relegated to reservist, and limited duty and warrant officers. Manning continued in this general manner until the summer of 1978, when the Special Operations community was created. For the first time, unrestricted line officers could devote career efforts, and repeat tours, in this community. Today we face the possibility of losing all the commissioned salvage ships as we downsize the Navy. Planning will ensure that we retain an adequate capability to support our requirements, and to satisfy public law. Consolidation and realignment of resources will permit us to accomplish more with less.

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**1993
Executive Research Project
S20**

**U.S. Navy Special Operations
Community--Diving and Salvage
Functional Area**

**Commander
James M. Evans
U.S. Navy**

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CHAPTER I

BACKGROUND

EARLY HISTORY

Marine salvage forces have been a part of, or associated with, the U.S. Navy since the last quarter of the nineteenth century, although first attempts at development of a permanent Navy salvage organization did not occur until early in the twentieth century. There were Navy divers (usually senior enlisted personnel) assigned to large ships, and in naval shipyards. A few ocean going tugs and numerous harbor tugs were available to conduct or assist in salvage operations. Periodically these assets were used to conduct salvage operations — sometimes independently and on other occasions in conjunction with contracted, civilian assets.¹ The most notable salvage operation prior to World War I was the raising of the sunken submarine F-4 that sank off the coast of Oahu, Hawaii in 1915. The efforts undertaken to determine the cause of this first sinking of a U.S. Navy submarine lead to the development of pioneering submarine salvage and deep diving techniques. F-4 sank in 51 fathoms of sea water from unknown causes. Both submariners, and design engineers, were concerned about its loss, and eager to determine the cause of the sinking. After successfully raising her, and determining the cause of her sinking (battery acid corroding rivets in the pressure hull), F-4 was declared beyond economical repair

¹C.A. Bartholomew, Mud, Muscle, and Miracles, Marine Salvage in the United States Navy, (Washington, DC, Naval Historical Center and Naval Sea Systems Command, 1990).

and was struck from the Navy list of ships. (Interestingly, F-4 today lays sunk on the bottom of Pearl Harbor off the Submarine Base pier S-20. There is some interest in raising her again as a museum show piece.)²

Partly because of the lack of standing salvage forces, the only Navy salvage successes during this era tended to be sinkings that presented a stable situation in which time was available to form an ad hoc salvage team when there was little probability of the problem becoming dramatically worse. Then the efforts of the few knowledgeable Navy salvors (once they were relieved from their regular duties at naval shipyards) could be focused on a solution to the problem. A few Navy Construction Corps Officers -- precursors to today's Engineering Duty Officers -- had some salvage experience, and almost no Line Officers had (nor desired to have) any knowledge or experience in salvage operations. The loss of the armored cruiser MILWAUKEE (C-21) reflects this attitude. The submarine H-3 ran aground in December 1916, and was stranded on Samoa Beach, near Eureka, California. Bids from commercial salvage companies ranged from \$18,000 to \$72,000, but were rejected by the Commandant, Mare Island Navy Yard because the costs were too great. Instead, he attempted to use the new, 21,000 shaft horsepower, MILWAUKEE to retract H-3 with a straight pull off the beach. MILWAUKEE would be pulling perpendicular to a strong beam current. As soon as she tensioned the wire, she was "in-irons" and was set aground by the current. Eventually, she was declared a complete loss. Subsequently the lowest bidder, civilian salvage company pulled H-3 off the beach for the agreed upon \$18,000. Using a simple, but effective plan, the salvors built a temporary track and hauled H-3 overland a little over a mile and launched her in Humbolt Bay. An experienced salvage engineer should easily have been able to predict the futility of the cruiser's effort. An experienced salvage operator (or even an experienced seaman!) would have recognized the gravity of the situation and taken greater precautions prior to being "in irons" in the heavy cross current.

²Phil Mayer, Honolulu Advertiser, Push Made to Lift Sunken Sub, (Honolulu, Hawaii, March 27, 1990).

WORLD WAR I

Our entry into World War I forced the Navy to develop a salvage organization that could provide coverage for ship breakdowns and strandings to help maintain open sea lines of communication. In an attempt to fulfill overseas salvage commitments, the Navy ran head on into one of the major problems with contracted assets. The three U.S. salvage companies in business on the eastern seaboard all felt the risks in providing services to the British (who had made an urgent request for assistance) were not justified. They refused the request to provide their services. The Navy then confiscated the salvage ships and put the experienced salvors who ran them into uniform as naval reservists in order to meet allied commitment support requirements. At home, salvage needs were met by a patchwork of ex-fishing boats using commercial equipment taken over by the Navy. Salvage assistance was provided to numerous military and commercial vessels in the North Atlantic.

The end of World War I was no different for salvors than the other armed forces. The salvage organization was almost completely abandoned. Franklin Roosevelt, the Assistant Secretary of the Navy, developed a plan to provide some peacetime salvage capability without the expense of maintaining full time active duty ships and personnel. The two post war remaining salvage companies on the East Coast were permitted to purchase new Bird-class mine sweepers (180 ft length overall, 950 ton displacement) for scrap value if they entered into a contract with the Navy to provide contingency salvage support and establish salvage bases on both the east and west coasts (4 ships east coast and 1 ship west coast). This typical "No-Cure, No-Pay"³ salvage

³Commercial salvors normally use a Lloyds Open Form contract that contains a "no cure, no pay" clause. This clause provides for the award of a percentage of the salvaged value of the property saved based on the difficulty

contract did provide some relief for the salvors with a "right of refusal" clause for work that they deemed too great a hazard. This contract was administered by Construction Corps Officers at the Bureau of Construction and Repair who still held the Navy's salvage expertise. The record of several contracted or mixed Navy/contractor salvage efforts prior to World War II were satisfactory when sufficient assets were available. In general, these rescue salvage and debatching operations required a strong element of operational (tactical) vice engineering expertise -- which the Navy did not possess. There is a dichotomy between the operators (ship drivers, expert seaman) and the engineers view of salvage that has continued to grow as ships became larger and more complex. In the difficult, complicated and complex operations, both the salvage seamanship and ship handling expertise of the operator, coupled with the technical skills of the salvage engineer are necessary, and complementary, to assure success. Simple salvage tasks can easily be handled successfully by either.

An additional dichotomy developed between the surface salvors and their submarine counterparts. While the surface forces were struggling with their contract support salvors, the submarine forces developed the expertise to become the best in the world in submarine rescue, salvage and helium-oxygen deep sea diving techniques. Of eight non-combat submarine sinkings between World Wars I and II, seven were raised. The depths of the salvage operations drove the development of mixed gas deep sea diving. The inability of early salvage attempts to rescue trapped survivors resulted in development of Submarine Rescue Vessels (ASR's) and the

and danger of the job. The salvor has a lien on and control of the property until adjudication of the salvage award. Use of this form has caused legal difficulties for the Navy in the past. Award of 10 per cent of the value of an Aegis cruiser would be prohibitive. The extreme fluctuation in fortune for commercial salvage companies based upon "no cure, no pay" contract usually means that their services are only available in the areas of the world with the most lucrative potential markets.

McCann Rescue Chamber (a surface tethered, one atmosphere, manned diving bell that mated to the submarine over a specially configured hatch). These efforts were generally contained within the Construction Corps engineers and the submarine communities, but were the nucleus from which our World War II salvage forces would grow. (This split between the surface and submarine diving communities is still present today.) A strong advocate of salvage forces was Captain Ernest J. King, U.S. Navy, who as the commander of the submarine base at New London, Connecticut was involved in the salvage of the sunken submarines S-4 and S-51. As the Chief of Naval Operations during World War II, Admiral King never lost sight of the importance of the salvage mission and its requirements for experienced men and adequate equipment.

WORLD WAR II

Shortly before our entry into World War II, the Navy's Salvage Contractor abandoned West Coast operations as uneconomical. This forced the Navy to form a real salvage organization. The position of Supervisor of Salvage was created as a special assistant to the Chief, Bureau of Construction and Repair (re-named BUSHIPS later). This position is unique in that it is one of the few from which operational functions are performed by the bureau, and it is filled by an engineer.

As tensions increased in the Pacific, the Navy planned for construction of ships and development of shore facilities. At the outbreak of war, only the salvage base at San Diego, California was in place. Out of necessity, and due to the extensive casualties inflicted upon the fleet by the Japanese, the Navy created salvage forces that would act as force multipliers for the fleet. The salvage efforts at Pearl Harbor provided a practical training ground to develop the expertise required. The massive overseas wartime tasks of harbor clearance, underwater repair,

rescue towing, off-ship fire fighting, stranding salvage, and even deep diving for intelligence exploitation of sunken enemy ships could not have been accomplished without this head-start and actual experience. The U.S. Navy built a fleet of salvage ships to sail with the fleet. They included numerous small oceangoing tugs (ATA's and ATR's), 69 large fleet tugs (ATF's) built and sized for convoy towing, 29 salvage ships (ARS's), 4 lift craft (ARS/D's), 3 mobile support base ships (ARS.T's), 11 mixed-gas diving and submarine rescue vessels (ASR's), and numerous landing craft configured for salvage work. This World War II salvage force was lead by an officer corps of naval reservists utilizing the expertise of warrant boatswains and engineers, and senior enlisted divers and salvors.

POST WORLD WAR II

In the post World War II draw down, salvage forces fared better than their combatant counterparts. The Navy was left with a large number of salvage ships and a unique organization. Chartered, contract salvage ships were quickly laid-up, and their functions were taken over by the large fleet of ATA's, ATF's, ARS's, and ASR's remaining in the active fleet. Fleet salvage ships continued to work for operational (task) commanders and performed numerous salvage missions. Due in part to the Public Law⁴ requirement for the Navy to maintain a viable salvage force, and its provision for rendering assistance to other government ships and craft, and to civilian shipping, many missions in support of Supervisor of Salvage tasking resulted in operational commanders being reimbursed for salvage expenses. In eras of tight budgets, active fleet salvage forces continued to work and were able to retain expertise due in part to these reimbursements. Harbor clearance assets were generally put in a lay-up status since they were not needed for any immediate deployment. The only significant post World War II clearance operations were in the

⁴10USC7361-10USC7367

late 50's in the Suez Canal. These operations, while massive in scope, were accomplished by multi-national, combined military and civilian forces in a benign environment.

VIET NAM

By the start of the Viet Nam War, the Navy still operated a large fleet of salvage ships, but there were no harbor clearance dedicated units. Numerous harbor clearance, or similar operations had been conducted by the Supervisor of Salvage using civilian or mixed Navy/civilian assets in a peacetime setting. Viet Nam dramatically pointed to the need for a uniformed combat harbor clearance unit when the SS CARD was sunk by an enemy mine in Saigon harbor in 1964. A make shift group, which included two salvage ships, an assortment of salvage engineers, and other "experts", patched, refloated and removed the CARD. The operational problems encountered revealed the need for a different, more responsive type of salvage organization and ultimately led to the formation of a new unit. Harbor Clearance Unit ONE (HCU-1) (now Mobile Diving and Salvage Unit ONE) was established to provide rapid response to salvage problems. Operating from a mobile support platform (a specially outfitted barge), this unit was outfitted and staffed to perform missions similar to the World War II harbor clearance efforts. Navy salvage experts additionally recognized the need for much more capable salvage assets, and the two heavy lift craft and several light lift craft were returned to service and assigned to HCU-1. In addition to the heavy and light lift craft, the unit was provided necessary support facilities, and numerous other converted landing craft and boats. Landing craft (LCM-6's) were converted to Combat Salvage Boats for individual teams to use for most river salvage operations. Teams from HCU-1 kept the Mekong Delta area waterways clear by removing large numbers of sunken boats and craft, barges, and aircraft, plus a few sunken or grounded ships. They were also used to provide flyaway teams for rapid salvage response throughout Southeast Asia as well as battle damage and recovery operations. This concept proved to be extremely successful and cost

effective. In theater salvage forces were again lead by a group of adventurous young reserve officers complemented by a small group of colorful Limited Duty, and Warrant Officers. The young reserve officers (1105's) drew upon the salvage expertise of the "Mustangs" and senior enlisted divers and craftmasters. Salvage engineers provided technical support and equipment for big jobs, and headquarters support for equipment and procedures. After withdrawal from Viet Nam, the heavy and light lift craft, and excess harbor clearance equipment were returned to reserve status again. Additionally, with the excitement and challenges of the war over, the reserve officer leadership left the salvage community to pursue other career opportunities. Fortunately, salvors with foresight were creating Harbor Clearance Unit detachments in the Naval Reserve, and many of these experienced young officers became drilling members of the reserve units. The Harbor Clearance Unit concept that had proven so effective during the war was retained. Flyaway salvage capability had become a reality. An additional unit, HCU-2, was created and was home ported at Little Creek, Virginia. HCU-1's homeport assignment was shifted to Pearl Harbor, Hawaii. The flyaway diving and light salvage team concept started during the Viet Nam era continues to be exceptionally effective. The deployment of the advance, light salvage team developed into a primary mission area for the units. They could be generally or specifically augmented during any mission by contractor personnel and equipment, or Navy salvage ships and assets, to provide cost effective and rapid solutions to a variety of salvage operations. An emerging mission for these teams is to augment battle damage repair efforts with special assistance teams. The Viet Nam era reflected the same manning patterns for salvage leadership as before. Navy salvage forces were again manned by naval officers of the Naval Reserve, and active duty limited duty and warrant officers. Management and major staff representation continued to be provided by the engineers from the Supervisor of Salvage Office in NAVSEA.

The post-war era after Viet Nam was a period of great Navy downsizing. Many vessels built to fight in World War II were 30 or more years old, and due to the operational tempo required to support the southeast Asia war, major maintenance periods had been deferred. A substantial number, including salvage ships, were identified for retirement. Many were not scheduled to be replaced as the nation drastically reduced the size of its armed forces. Additionally, the here-to-fore backbone of the Navy salvage force leadership, the "Mustangs," were no longer being assigned command of the remaining salvage ships. The mustangs were seasoned officers with significant salvage experience, and were skilled in bridge and seamanship evolutions. They had the background and experience essential to evaluate the performance of their crews and to take every available training opportunity to hone their salvage skills. Unrestricted line officers were assigned to salvage ship command, and while they had shown great potential, their experience and training were not in salvage. They had neither the unique seamanship skills required nor the experience to train their crews for salvage operations. In 1978, the Special Operations Officer (1140) community was established to aid in overcoming this lack of experience. This community was created by combining Explosive Ordnance Disposal (EOD) officers, Expendable Ordnance Management officers with the Diving and Salvage officers to provide focus in these areas in order to maintain expertise. Officers would become qualified in at least two functional areas -- normally EOD or Diving and Salvage, and Expendable Ordnance management. Officers trained in diving and salvage techniques were now allowed to follow a career pattern that took advantage of their training. Unrestricted line officers were now permitted to specialize in salvage, with repeat tours of duty, and advanced training. Career patterns were developed to ensure that officers assigned to command were seasoned in salvage operations and well qualified in the technical aspects of their trade. "The combination gave a breadth and depth of professionalism to Navy salvage that had not been possible before."⁵

⁵C.A. Bartholomew, Mud, Muscle, and Miracles, Marine Salvage in the United States Navy, (Washington, DC,

The combined efforts of both salvage operators and salvage engineers in the pursuit of common goals in maintaining an adequate uniformed combat salvage force, and continuous improvement of the force forged new areas for examination. Battle Damage Repair exercises have been conducted with limited participation by salvage elements. Efforts by the community to highlight the force multiplier effect of combat salvage forces led to limited consideration and only sporadic participation by salvage forces in major fleet exercises. The failure of the community to pursue Diving and Salvage billets on major staffs has resulted in very limited visibility in exercise and battle plan preparation. As noted by CDR K.L. Skudin, USN, "An entire generation of Task Force Commanders has "grown up" without exercising salvage ships." During previous Arabian Gulf operations, three U.S. Navy frigates experienced severe engineering or battle damage and had to be assisted by combatants because U.S. Navy salvage ships were not assigned to the area, and were not available.

DESERT SHIELD/STORM

The absence of salvors on the major staffs was reflected in the near total absence of plans for employment of salvage forces during Operation Desert Shield and Storm. During the massive buildup of naval and sealift forces, no salvage ship, shore based (MDSU) salvors, or salvage equipment were requested by the operational commander. Since salvage requirements were not spelled out at all, or were out dated, and no salvage officer was assigned to the USNAVCENT staff, no programmed Time-Phased Force and Deployment Data (TPFDD) file existed for salvage assets. Only by the last minute efforts of NAVSEA (Supervisor of Salvage office) and OPNAV (OP-03) staffs were an ad-hoc salvage organization and assets provided in

theater. This consisted mainly of contracted assets (Dutch ocean going tugs -- SMIT TAC New York, and Madura -- several off-shore work boats and a berthing/work barge) and more than 300 tons of portable Emergency Ship Salvage Equipment. One Navy salvage ship, USS BEAUFORT (ATS-2), and four salvage officers (no enlisted working divers) were in place before the war ended. Fortunately this limited force was able to provide immediate salvage assistance to USS TRIPOLI and USS PRINCETON during their mine hits in February 1991. The prompt assistance, inspection, and technical advice provided to USS PRINCETON may have saved her from breaking up. Contrasted with the early January 1991 grounding of USNS ANDREW J. HIGGINS, which remained aground for 3 days awaiting the assistance of a salvage engineer and divers, the assistance to PRINCETON was immediate and removed her from harms way so that she could be repaired to fight another day.⁶ Salvage assets in the Desert Storm theater were only adequate by the good fortune of a short war. Had the anticipated amphibious landing occurred at the same time as the two ship mine hits, we would not have been so lucky.

COMMUNITY STATUS

As we enter the post Cold War era and another round of downsizing, salvage forces and the 1140 community face many challenges. The current "Base Force" calls for a Navy of 450 ships to support a 12 carrier battle group force. Current planning calls for vertical as well as horizontal cuts to be taken out of the existing force, and necessarily calls for extensive reorganization. Today's salvage fleet consists of :

6 World War II vintage BOLSTER (ARS-38) class salvage ships

⁶K.L. Skudin, Salvage Support for the Operational Commander - What He Needs and May Not Get, (Naval War College, 1992)

3 1960's vintage EDENTON (ATS-1) class rescue and salvage ships

4 1980's vintage SAFEGUARD (ARS-50) class salvage ships

7 1970's vintage POWHATAN (T-ATF-166) class fleet tugs

20 TOTAL

On the basis of the April 1991, SALVAGE 2010 study⁷, this current force level is already two ships short of the 22 determined to be the minimum necessary to maintain an adequate salvage force. This force level is based upon the Surface Combat Force Requirements Study (SCFRS) and Center for Naval Analyses' (CNA) estimates of damaged ships and battle damage repair reflects a wartime salvage posture. As a previous cost saving measure, the 7 T-ATF-166 class fleet tugs were built to commercial standards, and are manned by civilian mariners of the Military Sealift Command. Active duty personnel are only embarked for specific missions. The remaining 13 ships have active duty crews with 1140 officers manning most of the wardroom billets. Special Operations Officer community manning is currently staffed at a 450 officer level (including EOD, EOM, and Diving & Salvage functional areas) and is planned to decrease to a 400 officer force. The six ARS-38 class ships are planned for decommissioning in 1995, and the ATS-1 class ships are scheduled for a Ship Life Extension Program (SLEP) near the end of this decade. There are no current plans to build more. Any salvage short fall will have to be met by creative use of existing forces or civilian contracts.

⁷Naval Sea Systems Command (00C), SALVAGE 2010, Navy Force Level Requirements for Salvage Ships,

(Washington, DC, Naval Sea Systems Command, Supervisor of Salvage, April 1991)

CHAPTER II

CURRENT ENVIRONMENT

FORCE REDUCTION

As previously discussed, the current force is inadequate to support wartime salvage requirements without resorting to contracting for the use of commercial assets. In August 1991, the Secretary of the Navy confirmed future salvage ships force levels based upon the recommendations from the SALVAGE 2010 Study. The ship levels supported are a mix of 14-15 commissioned ships and civilian mariner crewed MSC ships plus 8 contracted ships capable of being outfitted for salvage missions. This force level determination was based on littoral warfare support not the number of ships in the fleet. The essential elements of the active salvage force are:

Three Rescue and Salvage ships (ATS-1 class) capable of conducting heavy salvage, long distance towing, off-ship fire fighting, and Helium-Oxygen (HeO2) Mixed Gas diving. Twin controllable pitch screws, diesel powered, with 6000 shaft horsepower. These are the most capable Navy salvage ships.

Four Salvage ships (ARS-50 Class) capable of conducting heavy salvage, long distance towing, off-ship fire fighting, and Surface Supplied Air diving. Twin controllable pitch screws, diesel powered, with 4200 shaft horsepower. These are the newest ships in the salvage force.

Seven Fleet Tugs (T-ATF-166 Class) (MSC civilian mariner crewed) capable of conducting long distance towing and off-ship fire fighting. When augmented by a Diving and

Salvage Team and specialized equipment, capable of conducting diving and salvage operations. Limited deck space, berthing and hotel support services prevent conduct of some simultaneous and long duration operations. Outfitted with a full Navy communications suite and manned by a Navy communications detachment. Twin controllable pitch screws, diesel powered with 7200 shaft horsepower.

Mobile Diving and Salvage Unit (MDSU) detachments. Specially trained Navy salvors lead by 1140 officers to embark in T-ATF's to provide a core of personnel "in theater" to provide salvage support for harbor clearance, stranding retraction, diving, and other essential services.

Commercial salvage ships. Hired as required with direction by the contracting authority only. There is no guarantee any will be willing to go "in harms way." Communications suite limited to commercial sea going standards and portable Navy equipment. Capable of embarking and supporting a MDSU detachment for extended periods. Up to 8 required to support regional warfare scenario outlined in SALVAGE 2010.

Three standing worldwide commercial salvage contracts administered by the Supervisor of Salvage. These contracts, alone or together, are frequently used to obtain salvage support during peacetime.

Emergency Ship Salvage Material (ESSM) System. Eight bases located at various worldwide sites. Each contains a substantial inventory of equipment to support salvage operations (including major oil spill clean-up equipment). Use, control, and administration of all ESSM assets are through the office of the Supervisor of Salvage.

Naval Reserve assets include both ships and personnel. The reserve contributions to the salvage forces include:

Three Salvage ships (ARS-38 Class) capable of heavy salvage, long distance towing, off-

ship fire fighting, and Surface Supplied Diving operations. Crewed by a combination of active duty Navy and Naval Reservists. Twin screw, diesel electric propulsion with 3000 shaft horsepower. These ships are scheduled for decommissioning by the end of fiscal year 1995.

Reserve MDSU Detachments. Fourteen detachments located at various Naval Reserve Centers around the country. Each RDET has either MDSU-1 or MDSU-2 as a gaining (or mobilization) command. All train to active duty standards and undergo diving and safety assessments identical to their active duty counterparts. Four-fifths of the Navy's diving and salvage capability resides in these reserve elements.

Reduction of salvage forces will have the most dramatic impact of the staffs that have traditionally directed, trained, controlled and supported salvage elements. Both of the remaining Combat Support Squadron staffs will be disestablished within the next two years. Disposition of the 1140 officer billets has not been fully resolved. An attempt was made to shift the billets to major planning staffs. The salvage ships will be reassigned to another Immediate Superior in Command (ISIC).

NEED FOR SALVAGE FORCES

In a littoral warfare environment, salvage ships perform many functions for which they are uniquely suited. They act as combat force multipliers by providing combat salvage and rescue towing missions. Amphibious support services keep boat lanes clear as well as providing combat multiplier support for the amphibious task force ships. Off-ship fire fighting capabilities not only support combatant ships but as recently demonstrated, USS BEAUFORT (ATS-2) used her installed water canons (foam capable fire fighting monitors) to fight out-of-control fires on a 285,000 deadweight ton Very Large Crude Carrier (VLCC) and a 40,000 deadweight ton

Motor Gasoline (MOGAS) carrier.⁸ Salvage ships also perform missions that would otherwise take a combatant ship away from its primary function or would otherwise expose a high value unit to unwarranted risks.

Salvage ships are designed to accomplish a variety of missions, principal of which is combat salvage. A commissioned salvage ship provides immediate local assistance to help stabilize a combat casualty either by coming alongside, or deploying a flyaway team of properly trained and equipped salvors and off-ship fire fighters. In worse case scenarios, the salvage ship then extracts the damaged ships from the combat zone, and transfers the tow or escort responsibility to a T-ATF or commercial, contract tug. Either of these vessels then moves the casualty to a secure, rear area for repair by a shipyard or tender. This scenario describes the events after the PRINCETON mine hit almost exactly.

An often forgotten mission, capability and function of salvage ships is to keep boat lanes open during amphibious landings⁹. The relatively narrow boat lanes can easily become blocked by landing craft due to stranding, mechanical breakdown or hostile fire damage. Even in the over-the-horizon amphibious force of the future, salvage ships (or boats) can provide a force multiplier effect in the rescue and salvage of any type disabled landing craft.

Salvage ships, or MDSU teams working from a craft of opportunity provide a harbor clearance capability to move, flatten (with underwater explosives) or otherwise clear sunken or stranded obstacles blocking port facilities. Emergency channel clearance, survey, and remarking facilitate the expeditious transfer of combat support materiel ashore.

⁸R.P. Fiske, Memorandum, Importance of Salvage in Littoral Warfare, (October 1992)

⁹W.R. Carter, Beans, Bullets, and Black Oil (Washington, DC, Department of the Navy, 1953)

ADDITIONAL CONCEPTS AND TRAINING

As the size of the force decreases, the numbers of diving and salvage officers in the special operations community will be reduced drastically. In part due to the lack of billets in this functional area, but more significantly, young officers will see this as a dead end path. More will be expected of those remaining to ensure adequate fleet support is maintained. Specialized training is one method of gaining expertise to help offset the loss of assets. Use of commercial salvage and marine fire fighting schools to provide specialized qualifications in areas not taught in Navy schools or training courses will help overcome the loss of practical experience that would have been gained by service in the fleet.

In the past, several substantial attempts to reassign all divers (both 1140 officers and enlisted divers) to shore based consolidated units from the salvage ships have been successfully fought off. The principal arguments for this action were to alleviate diver manning shortfalls, consolidation for more efficient and effective employment of assets, and enhanced proficiency of divers achieved by commonality of training and control of the training curriculum. In much the same way as special warfare and explosive ordnance disposal communities have all operational elements of their communities directly under their control, it was envisioned that a similar concept would be more effective for the diving and salvage community. The most persuasive argument to keep the divers onboard the salvage is the lack of formal, practical, hands-on training in marine salvage at any training command. Theoretical aspects of salvage are still taught at the Naval Diving and Training Center, but all practical application of the theory is no longer part of their curriculum. Only through the use of the various salvage manuals -- many of which are still not current -- and on-the-job training onboard salvage ships can the necessary experience, appreciation for the dangers involved, and technical skills be acquired. As the budget and the size of the salvage forces decrease, and the 1140 training pipeline (Professional Development

Path) (attachment 1) becomes longer, salvage experience and the level of expertise continue to decline.

Public Law¹⁰ still requires the Navy to maintain a salvage capability. The loss of capability represented by the commissioned ships will have to be replaced by mobile, flyaway teams of salvage specialists, lead by 1140 officers. Force Salvage Commanders (FSC)¹¹ act to control salvage forces, similar in concept to the anti-air warfare coordinator (AWC) or surface action group commander (SAGC). "During salvage operations, the senior salvage commanding officer is responsible for coordinating the efforts of salvage ships ..."¹² Salvage Assistance Response Teams (SART) are casualty response concepts to satisfy both peacetime and wartime demands for salvage services. SARTs would be flown in to the distressed ship to render immediate assistance in advance of a salvage ship's arrival on site. The FSC would have elements of the integrated Navy ship salvage system available to provide the most effective response from salvage ships, embarked MDSU teams, SARTs, and ESSM. In the downsized Navy, SARTs may prove to be the linchpin of an effective ship salvage system. The SART provides a flyaway, rapid-response fire fighting, ship stability and structural analysis, and salvage assistance to a casualty as a stopgap measure before salvage ships arrive. The SART must be fully incorporated into future concept of operations (CONOPS) and operations plans. The Navy must take steps to maximize the survivability of combatant ships through advanced training of SARTs and strengthening of MDSU manning to adequately fulfill salvage requirements. Finally,

¹⁰10USC7361

¹¹Navy Department, Surface Ship Survivability, Naval Warfare Publication, (NWP 62-1, Revision C) (Washington, DC, December 1989)

¹²Navy Department, Surface Ship Survivability, Naval Warfare Publication, (NWP 62-1, Revision C pg. 9-20) (Washington, DC, December 1989)

any shortfalls in salvage capability must be fulfilled by commercial contracts for salvage services to maintain the desired level of ship, equipment, and personnel readiness. In the interim, the NAVSEA OOC worldwide salvage contracts will be used to support operational requirements that can not be met by fleet units. Additional study must be conducted to ensure all essential services and contingencies will be covered under salvage contracts.

DIVING AND SALVAGE FUNCTIONAL AREA OFFICER

MANNING

The size of the salvage fleet will be the primary determinate of the numbers of Special Operations (Diving and Salvage Functional Area) Officers required to support the fleet. Loss of commissioned ships to decommissioning, transfer to the Naval Reserve, or shifts to Military Sealift Command civilian mariner operation will have the greatest affect on manning. Not only will this affect the total numbers of 1140 in the diving and salvage functional areas but will have a significant affect on officers being selected for Commander Command, and subsequently to Major Command. While the commanding officer of all classes of commissioned salvage ships is a Lieutenant Commander billet, successful command at sea is a significant milestone for advancement and selection for subsequent command. In a recently approved change to the current Special Operations Professional Development Path, all entry level officers are required to complete both Diving and Salvage, and Explosive Ordnance Disposal training during the core training phase, and after completion of the first sea tour respectively. Most 1140 officers are now only trained in one of these two functional areas. The opportunity for command for the EOD officer at the commander level is substantially greater than that of his D&S counterpart. There are presently 6 Commander Commands in the EOD functional area, and 4 (of which, only 2 will remain at the end of FY-95) in the D&S functional area. There is 1 EOM Commander Command which is open to either functional area for qualified officers. If our best young

officers aspire to command at sea, we must provide a promotable follow-on path in order for them to grow and further serve the community.

A number of manning plans and mixes of ship have been proposed in attempts to continue to provide sufficient salvage forces to meet requirements while recognizing the need to reduce cost for such forces to a bare minimum.¹³ These proposals range from the status quo of today to transferring all salvage ship operations to MSC. The SALVAGE 2010 Study determined that a minimum of 9 ships would be required to support combat casualty response requirements, and 10 ships would be required to support a major wartime sealift.

COMBAT CASUALTY RESPONSE REQUIREMENTS

Based upon a Center for Naval Analysis study,¹⁴ which used a scenario and data from the SCFRS,¹⁵ plus consideration for Amphibious Assault ships, Mine Warfare ships, and Combat Logistics Force ships, the number of salvage ships required is nine.

SEALIFT REQUIREMENTS

THEATER OF OPERATIONS. Risks are greatest, and needs more diverse in the wartime theater of operations. There are risks of weapons strikes, ship collisions, fire, and mechanical breakdown. Any one of these could occur in a contiguous zone and require the

¹³Naval Sea Systems Command (00C), SALVAGE 2010, Navy Force Level Requirements for Salvage Ships, (Washington, DC, Naval Sea Systems Command, Supervisor of Salvage, April 1991)

¹⁴CNA Research Memorandum 89-82, Estimates of the Number of Damaged Ships and Personnel Casualties After Engagement (U), Classified, December 22, 1989.

¹⁵Office of the Chief of Naval Operations ltr ser 03/8S582038, Surface Combatant Force Requirements Study, Classified, August 11, 1988.

assistance of two salvage ships. Afloat salvage assets dedicated to combat casualty response could not be depended upon for theater sealift salvage coverage. Four ships are required.

PORT OF ORIGIN. The next highest level of risk occurs in the region of the port of origin of the sealift. The study determined that two ships per coast would be necessary. Four ships required.

SLOC OCEAN TRANSIT. A substantially lower level of risk is incurred during open ocean transit, but sealift ships are subject to any number of marine casualties. Mechanical breakdown is a significant factor. As demonstrated in Desert Storm, mechanical breakdown of the reserve merchantmen during their initial long transits requires dedicated salvage or towing ships standing by for immediate response and assistance. One ship per coast should be located along the track to the war zone. Two ships required.

<u>MINIMUM FORCE LEVEL</u>

DEMAND CATEGORY	NUMBER OF SHIPS
Combat Casualty Response	9
Sealift Support	10
TOTAL	19
Plus 15% non-deployable = 2. TOTAL	22

The current mix of the salvage force is made up of 9 commissioned hulls, 3 of which are Naval Reserve Force ships, and 7 MSC fleet tugs. The options considered included 5 primary alternatives:

- Active USN Salvage Ships

Fully operational throughout peace-war continuum

Manned by active duty Navy personnel

Front-line, fully capable of wartime theater, combat-zone, sealift, contiguous-theater and SLOC salvage and towing operations

- MSC T-ships

Fully operational throughout peace-war continuum, with option for reduced operational status in peacetime

Manned by civilian MSC merchant mariners or commercial contract crew, a small naval communications detachment and, when required, a MDSU/RMDSU team embarked for salvage operations

- MARAD RRF

Deactivated Navy ship, MSC T-ship, or laid-up commercial salvage vessel

Cold iron, non-operational in peacetime. Mobilized quickly for war

Backup for front-line ships in sealift, contiguous-theater and SLOC towing and salvage operations

Manned by USNR or reserve MSC crews and RMDSU salvage teams

- AMERICAN-FLAG COMMERCIAL

Few fully-found salvage ships, but numerous offshore support vessel platforms with towing and fire fighting capability and deck space for portable diving and salvage equipment

Chartered as needed throughout peace-war continuum

Commercial crews with U.S. Navy MDSU/RMDSU or commercial salvage crews

Combat-zone backup to front-line USN and MSC salvage and towing ships

Fully capable for sealift, contiguous-theater and SLOC requirements

- FOREIGN-FLAG COMMERCIAL

A function of geopolitical conditions, alliances, and declarations of neutrality

Foreign national crews with foreign or U.S. Navy MDSU salvage teams

Chartered as needed throughout the peace-war continuum

Combat zone backup to front-line USN and MSC salvage and towing ships

Fully capable for sealift contiguous theater and SLOC requirements¹⁶

These alternatives were synthesized into the two most promising options. The first is a combination of active-duty Navy, MSC, and commercial ships. The Supervisor of Salvage will contract for commercial assets to meet all shortfalls and the contract will have contingencies for increased commercial ships to substitute for decommissioned Navy ships that are not replaced. The second option is for a force composed of only MSC and commercial ships. The commercial ships of either option may have to be Government Owned - Contractor Operated (GOCO) due to commercial inventories. The international salvage community is extremely concerned by the tremendous increase in pollution control responsibilities. The incentive to continue to operate -- profit at an acceptable risk -- is disappearing rapidly.¹⁷ Both options will require greater use of SARTs or MDSU salvage teams, will call for significantly fewer 1140 D&S officers.

¹⁶Naval Sea Systems Command (00C), SALVAGE 2010, Navy Force Level Requirements for Salvage Ships,

(Washington, DC Naval Sea Systems Command, Supervisor of Salvage, April 1991)

¹⁷K.J. Reinigert, Marine Emergency Services Toward a New Understanding, Eleventh International Tug

Convention and International Marine Salvage Symposium 1990

CHAPTER III

RECOMMENDATIONS

The 1140 community, and especially, the Diving and Salvage functional area, must be pro-active in ensuring that the Navy has adequate salvage forces, and that they are manned with well trained, experienced, and highly motivated officers. Consolidation of forces is a viable solution to meeting constant requirements with diminishing resources. The 1140 D&S is the traditional "Ship Driver" in the Special Operations community. As more and more assets become civilian operated ships, the personnel interested in command-at-sea must find alternate sources to fulfill this need. Mine Warfare offers this opportunity for highly motivated and interested officers. The 1140 community is slated to receive half the commanding officer billets on mine warfare ships and an even greater proportion of the other wardroom billets.

Creation of Special Operations Groups on both coasts where EOD and Diving and Salvage Mobile Units work for respective 1140 group commanders. This requires integration of Mobile Diving and Salvage Units into the existing EOD Group as equals to the EOD Mobile Unit commanders, and adding a diving and salvage section to the existing EOD Training and Evaluation Units. This would keep diving and salvage an operational, fleet service function with a mission of immediate response to operating units.

Underwater ships husbandry is a substantial and increasingly important element of fleet diving, and the MDSU's integrated into SPECOPSGRU's should maintain an underwater ships husbandry department similar to MDSU-1's Fleet Maintenance Dive Team. The special operations, submarine repair, and the engineering duty officer communities have proportional

interest in this area. Diver waterborne repair of underwater fittings, hull plating, and sensors, plus underwater hull cleaning save substantial ship downtime, and repair dollars. Each of the communities has its own agenda for underwater ships husbandry, but this is an area where 1140 D&S officers must make a strong effort to become the Navy's experts. Accomplishment of this would lead to the natural progression as seen in Special Warfare and Explosive Ordnance Disposal where all enlisted divers work for, or are controlled by the Special Operations community. Fleet enlisted divers are already controlled by a single detailer. If all commissioned salvage ships are lost, the control and management of the fleet enlisted diver community becomes more important.

The successful seagoing experience gained by the 1140 D&S officers makes them promotable, and allows them to achieve leadership and command positions in the Expendable Ordnance Management community. Most senior officer billets in the 1140 community are in the EOM functional area. With the creation of the Naval Ordnance Center¹⁸, under a flag officer, a billet has been created in which the community can promote the first U.S. Navy Special Operations officer to Admiral.

¹⁸Sean O'Keefe, Memorandum for the Chief of Naval Operations, Ordnance Fleet Support, (Washington, DC, Secretary of the Navy, 5 January 1993)

CHAPTER IV

CONCLUSIONS

The downsizing of the entire Navy will have a significant impact on the Special Operations Community, and especially the Diving and Salvage functional area. Much of this change will be painful, and will result in a smaller, leaner community. The 1140 community will decline from a level of almost 500 to approximately 400 under the "Base Force" manning levels. The extent of further cuts under the administration pose substantial uncertainty. Much work is required to get salvage requirements articulated in major concept of operations, operations plans, and operations orders.

Consolidation of resources, creative use of assets, and realistic assessment of the roles and missions of the community, will allow us to fulfill requirements to support the Navy's ... "From the Sea, Preparing the Naval Service for the 21st Century". Salvage forces are well suited to provide combat salvage services in a littoral warfare environment. This capability is often overlooked by war planners when trying to integrate the various function and mission resources in the joint arena. Salvage forces bring a myriad of support roles to the table including: retraction of grounded ships, recovery of small craft, harbor clearance, combat towing, amphibious assault support, object recovery, mine warfare support, and battle damage repair.